

Scaled data based on original data using

LM-41-14 Approved Method for Photometric Testing Of Indoor Fluorescent Luminaires

Test Report Prepared for

Cooper Lighting Solutions

(formerly Eaton)

Brand: METALUX

Report Number: 17278

Luminaire Tested: **HBE-432-W-UNV-EB81/PLUS-UPL-U**

Issue Date: 3/3/2020



Test Information

Test Method: LM-41-14
Report Number: 17278
Test Lab: LUMINAIRE TESTING LABORATORY, INC.
Issue Date: 3/3/2020
Manufacturer: COOPER LIGHTING SOLUTIONS (FORMERLY EATON)
Product Line: METALUX
Catalog Number: HBE-432-W-UNV-EB81/PLUS-UPL-U
Description: OPEN HIGH BAY LUMINAIRE WITH SIDE ENCLOSURES AND WHITE REFLECTOR, WIDE DISTRIBUTION WITH UPLIGHT
Light Source: FOUR 32 WATT T8 - 2850 LUMENS EA
Ballast/Driver: -

Summary

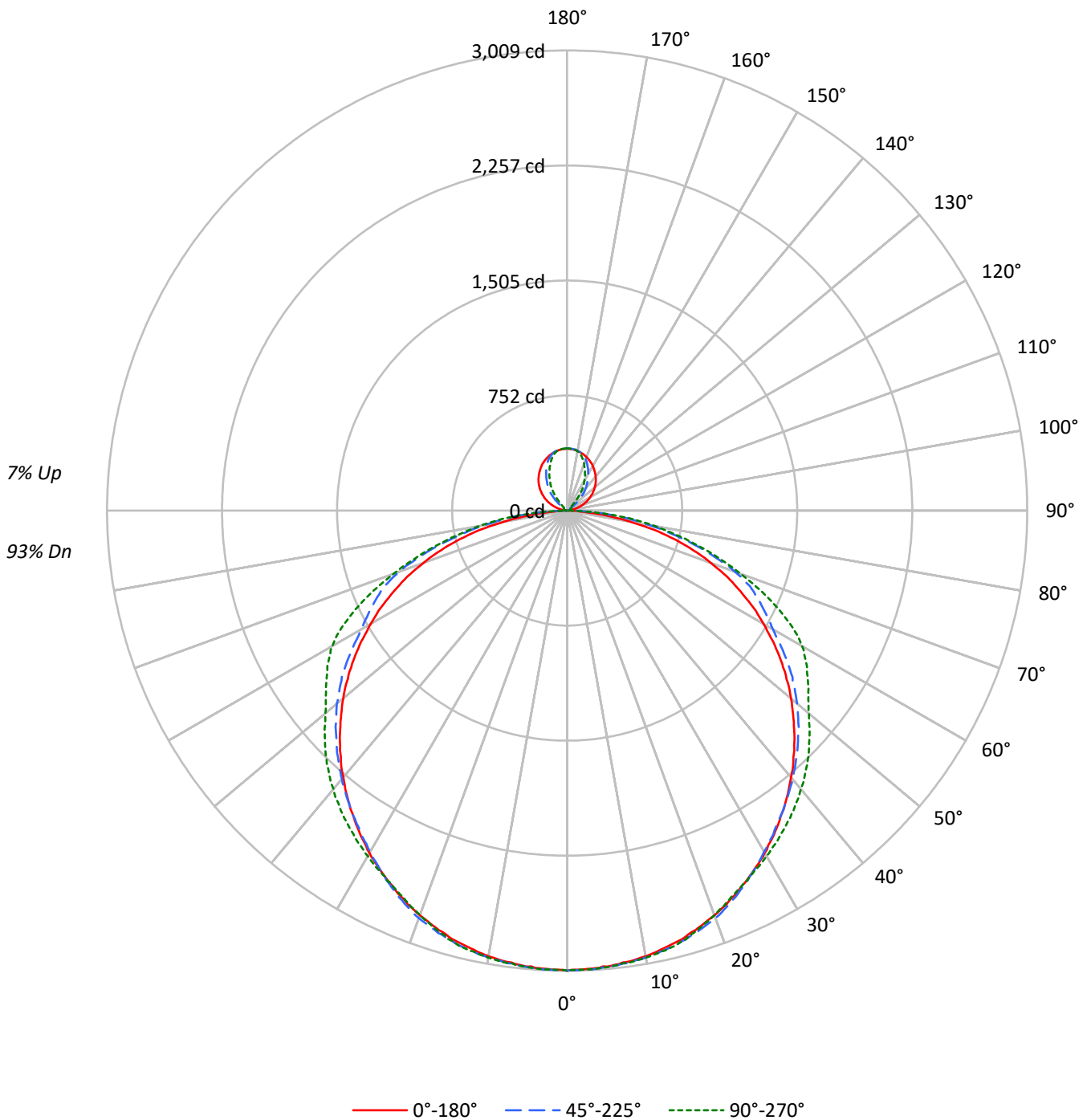
Lumens per Lamp: 2850 (4 lamps)
Luminaire Lumens: 10336.4 lumens
Efficiency: 90.7%
Efficacy: 71.5 lumens/watt
Spacing Criteria (0/90/45): 1.28 / 1.3 / 1.42
Luminous Opening: Rectangular (W 1.59' x L: 4.02' x H: 0')
CIE Type: Direct

Input Watts (W): 144.5
Input Voltage (V): NR
Input Current (Ain): NR
Voltage Rise (V): NR
Power Factor: NR
Total Harmonic Distortion (THDi): NR
Frequency (hertz): 60
Stabilization Time: NR
Operation Time: NR
Ambient Temperature (°C): NR
Test Distance: 25 FT

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Luminous Intensity Polar Plot





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COEFFICIENT OF UTILIZATION - ZONAL CAVITY METHOD:

RF	20				20				20				20				20	
RC	80				70				50				30				10	0
RW	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	106	106	106	106	103	103	103	103	97	97	97	92	92	92	87	87	87	84
1	96	92	88	84	93	89	85	82	84	81	78	79	77	75	75	73	71	69
2	87	79	73	67	84	77	71	66	73	68	63	69	65	61	65	62	59	56
3	79	69	61	55	76	67	60	54	64	57	53	60	55	51	57	53	49	47
4	72	61	53	46	69	59	52	46	56	50	44	53	48	43	51	46	42	40
5	66	54	46	40	64	53	45	39	50	43	38	48	42	37	45	40	36	34
6	61	49	40	34	59	47	40	34	45	38	33	43	37	32	41	36	31	29
7	56	44	36	30	54	43	35	30	41	34	29	39	33	28	37	32	28	26
8	52	40	32	27	51	39	32	26	37	31	26	36	30	25	34	29	25	23
9	49	37	29	24	47	36	29	24	34	28	23	33	27	23	31	26	22	21
10	46	34	26	22	44	33	26	21	32	25	21	30	25	21	29	24	20	19

AVERAGE LUMINANCE (cd/sqm):

	0°	45°	90°
0°	5053	5053	5053
5°	5047	5052	5052
10°	5048	5060	5061
15°	5045	5066	5066
20°	5033	5068	5031
25°	5016	5036	5014
30°	5011	4997	5057
35°	4996	4996	5131
40°	4992	5022	5213
45°	4995	5071	5308
50°	4995	5134	5395
55°	4992	5177	5622
60°	4981	5223	5958
65°	4975	5492	6076
70°	4915	5715	5917
75°	4737	5593	5755
80°	4052	5319	5638
85°	2543	5068	5145



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ZONAL LUMENS:

CANDELA DISTRIBUTION:

Zone	Lumens	% Fixture	% Lamp		0°	22.5°	45°	67.5°	90°	Flux
0°-10°	285.2	2.8	2.5	0°	3009	3009	3009	3009	3009	
10°-20°	822.1	8.0	7.2	5°	2994	3004	2997	3002	2997	285
20°-30°	1253.1	12.1	11.0	15°	2902	2913	2914	2920	2914	818
30°-40°	1541.7	14.9	13.5	25°	2707	2732	2718	2706	2706	1249
40°-50°	1657.7	16.0	14.5	35°	2437	2456	2437	2484	2503	1527
50°-60°	1589.7	15.4	13.9	45°	2103	2078	2135	2210	2235	1622
60°-70°	1349.6	13.1	11.8	55°	1705	1656	1768	1866	1920	1524
70°-80°	866.8	8.4	7.6	65°	1252	1203	1382	1510	1529	1237
80°-90°	263.4	2.5	2.3	75°	730	736	862	882	887	761
90°-100°	10.5	0.1	0.1	85°	132	225	263	266	267	169
100°-110°	27.4	0.3	0.2	90°	2	8	9	11	11	5
110°-120°	45.9	0.4	0.4	95°	14	8	8	7	8	16
120°-130°	71.0	0.7	0.6	105°	70	13	20	24	25	75
130°-140°	112.1	1.1	1.0	115°	140	51	21	28	30	139
140°-150°	149.2	1.4	1.3	125°	205	138	32	24	25	183
150°-160°	146.1	1.4	1.3	135°	264	220	140	63	43	203
160°-170°	106.5	1.0	0.9	145°	313	295	231	192	175	196
170°-180°	38.4	0.4	0.3	155°	355	353	318	287	274	164
0°-30°	2360.4	22.8	20.7	165°	386	390	382	372	366	109
0°-40°	3902.1	37.8	34.2	175°	403	408	405	405	404	38
0°-60°	7149.5	69.2	62.7	180°	407	407	407	407	407	
0°-90°	9629.3	93.2	84.5							
90°-120°	83.8	0.8	0.7							
90°-150°	416.1	4.0	3.7							
90°-180°	707.0	6.8	6.2							
0°-180°	10336.4	100.0	90.7							



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CANDELA DISTRIBUTION (FULL):

	0°	22.5°	45°	67.5°	90°
0°	3009	3009	3009	3009	3009
0.5°	3004	3014	3006	3009	3004
1°	3003	3013	3006	3008	3004
1.5°	3003	3013	3006	3008	3004
2°	3002	3012	3004	3006	3004
2.5°	3000	3011	3004	3007	3004
3°	2999	3010	3005	3007	3003
3.5°	2997	3008	3002	3005	3002
4°	2997	3007	3001	3003	2999
4.5°	2990	3003	2997	2999	2998
5°	2994	3004	2997	3002	2997
5.5°	2991	3001	2994	3000	2994
6°	2987	2999	2992	2997	2991
6.5°	2984	2996	2990	2994	2990
7°	2978	2990	2985	2989	2983
7.5°	2978	2989	2985	2990	2984
8°	2975	2988	2981	2986	2982
8.5°	2971	2983	2977	2984	2979
9°	2966	2979	2974	2979	2975
9.5°	2962	2973	2972	2975	2973
10°	2960	2970	2967	2971	2968
10.5°	2955	2966	2962	2968	2964
11°	2949	2963	2959	2964	2959
11.5°	2944	2955	2955	2960	2956
12°	2935	2947	2947	2951	2947
12.5°	2931	2946	2944	2949	2948
13°	2925	2940	2938	2944	2941
13.5°	2918	2935	2933	2938	2936
14°	2913	2928	2929	2935	2931
14.5°	2907	2920	2922	2927	2921
15°	2902	2913	2914	2920	2914
15.5°	2893	2906	2909	2914	2908
16°	2882	2898	2900	2903	2893
16.5°	2874	2890	2892	2894	2886
17°	2869	2885	2888	2886	2878
17.5°	2859	2876	2877	2876	2867
18°	2851	2868	2869	2865	2857
18.5°	2841	2859	2860	2857	2846
19°	2832	2850	2852	2847	2837
19.5°	2824	2843	2845	2835	2826
20°	2816	2832	2836	2825	2815
20.5°	2807	2825	2826	2813	2804
21°	2796	2816	2816	2801	2791
21.5°	2787	2806	2803	2789	2784
22°	2779	2796	2793	2777	2771



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
22.5°	2765	2786	2781	2767	2760
23°	2752	2773	2767	2753	2745
23.5°	2744	2767	2757	2743	2738
24°	2734	2755	2743	2733	2726
24.5°	2720	2743	2729	2717	2716
25°	2707	2732	2718	2706	2706
25.5°	2698	2720	2702	2695	2693
26°	2686	2712	2691	2686	2689
26.5°	2673	2697	2675	2673	2674
27°	2661	2684	2663	2661	2666
27.5°	2648	2670	2650	2650	2656
28°	2636	2662	2633	2641	2648
28.5°	2624	2648	2619	2630	2640
29°	2611	2633	2607	2618	2630
29.5°	2600	2620	2593	2608	2620
30°	2584	2608	2577	2598	2608
30.5°	2573	2595	2564	2588	2601
31°	2554	2580	2547	2576	2587
31.5°	2542	2564	2534	2565	2577
32°	2529	2551	2521	2552	2569
32.5°	2515	2539	2510	2546	2560
33°	2499	2519	2491	2530	2548
33.5°	2484	2505	2477	2521	2535
34°	2470	2489	2464	2509	2525
34.5°	2455	2472	2449	2498	2515
35°	2437	2456	2437	2484	2503
35.5°	2424	2440	2423	2474	2491
36°	2411	2423	2409	2460	2482
36.5°	2393	2405	2393	2450	2468
37°	2378	2388	2380	2438	2459
37.5°	2361	2372	2366	2425	2444
38°	2346	2353	2352	2410	2429
38.5°	2329	2335	2337	2398	2419
39°	2311	2315	2322	2387	2409
39.5°	2295	2296	2309	2375	2393
40°	2277	2279	2291	2360	2378
40.5°	2263	2261	2277	2345	2366
41°	2247	2242	2261	2331	2356
41.5°	2229	2221	2247	2318	2339
42°	2210	2200	2231	2306	2325
42.5°	2190	2182	2214	2289	2308
43°	2174	2161	2199	2272	2295
43.5°	2159	2142	2186	2261	2283
44°	2136	2120	2168	2244	2266
44.5°	2120	2100	2152	2226	2251



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
45°	2103	2078	2135	2210	2235
45.5°	2083	2058	2117	2193	2217
46°	2063	2037	2101	2178	2200
46.5°	2044	2015	2086	2162	2183
47°	2028	1998	2071	2148	2167
47.5°	2007	1973	2050	2127	2150
48°	1989	1956	2034	2114	2135
48.5°	1969	1934	2016	2095	2115
49°	1950	1911	1999	2075	2096
49.5°	1932	1891	1982	2057	2080
50°	1912	1870	1965	2043	2065
50.5°	1892	1850	1944	2022	2046
51°	1873	1829	1926	2002	2032
51.5°	1854	1809	1906	1982	2016
52°	1833	1786	1887	1964	2002
52.5°	1807	1766	1868	1947	1989
53°	1791	1742	1847	1929	1975
53.5°	1772	1723	1833	1914	1963
54°	1745	1702	1809	1897	1948
54.5°	1728	1680	1790	1880	1934
55°	1705	1656	1768	1866	1920
55.5°	1685	1636	1747	1852	1907
56°	1662	1613	1725	1837	1891
56.5°	1639	1592	1704	1821	1880
57°	1619	1573	1684	1810	1870
57.5°	1598	1549	1660	1794	1853
58°	1572	1524	1639	1777	1837
58.5°	1549	1502	1614	1764	1822
59°	1526	1479	1592	1749	1807
59.5°	1509	1460	1575	1737	1794
60°	1483	1436	1555	1721	1774
60.5°	1463	1414	1536	1706	1754
61°	1440	1391	1521	1691	1736
61.5°	1418	1369	1503	1674	1713
62°	1397	1346	1484	1653	1689
62.5°	1373	1322	1467	1633	1665
63°	1348	1299	1450	1608	1637
63.5°	1324	1275	1432	1587	1610
64°	1298	1252	1414	1561	1583
64.5°	1275	1226	1398	1536	1556
65°	1252	1203	1382	1510	1529
65.5°	1227	1177	1365	1481	1495
66°	1201	1151	1346	1454	1464
66.5°	1180	1131	1331	1428	1435
67°	1154	1105	1311	1393	1403



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
67.5°	1133	1082	1293	1364	1372
68°	1104	1055	1266	1330	1337
68.5°	1079	1032	1245	1303	1306
69°	1051	1005	1221	1270	1274
69.5°	1025	978	1192	1231	1238
70°	1001	955	1164	1199	1205
70.5°	976	931	1139	1168	1176
71°	953	909	1116	1139	1146
71.5°	922	881	1077	1105	1109
72°	894	860	1048	1074	1080
72.5°	865	834	1016	1039	1043
73°	841	817	985	1010	1014
73.5°	813	796	955	978	984
74°	782	775	927	947	955
74.5°	755	755	894	917	920
75°	730	736	862	882	887
75.5°	697	720	828	851	856
76°	672	701	792	820	824
76.5°	641	683	763	789	795
77°	615	661	734	757	767
77.5°	585	639	703	728	727
78°	544	618	670	696	697
78.5°	516	591	644	659	669
79°	481	560	611	634	640
79.5°	444	530	579	605	610
80°	419	502	550	576	583
80.5°	390	474	519	549	552
81°	360	445	486	514	520
81.5°	329	416	459	485	490
82°	299	388	432	455	466
82.5°	272	360	404	430	438
83°	241	331	374	401	403
83.5°	210	303	349	371	366
84°	182	276	321	335	333
84.5°	155	249	292	300	299
85°	132	225	263	266	267
85.5°	112	201	234	233	233
86°	89	172	198	199	193
86.5°	66	146	166	159	151
87°	49	124	133	124	116
87.5°	37	99	97	93	87
88°	25	72	68	64	60
88.5°	16	46	42	39	40
89°	8	26	22	21	21
89.5°	4	11	9	9	8



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
90°	2	8	9	11	11
90.5°	2	5	8	11	10
91°	2	3	4	5	5
91.5°	3	3	4	4	4
92°	4	4	4	4	4
92.5°	5	5	5	5	5
93°	7	6	6	6	6
93.5°	9	6	6	6	6
94°	10	7	6	7	7
94.5°	12	7	6	7	7
95°	14	8	8	7	8
95.5°	16	8	9	8	8
96°	18	9	10	8	8
96.5°	20	9	11	10	9
97°	22	10	11	11	11
97.5°	25	10	13	12	12
98°	27	10	14	13	13
98.5°	30	11	15	14	14
99°	33	11	15	16	14
99.5°	36	11	15	17	17
100°	39	12	16	18	19
100.5°	43	12	16	19	20
101°	46	12	17	19	20
101.5°	49	12	17	20	20
102°	52	12	18	21	21
102.5°	54	12	18	21	22
103°	57	12	18	21	22
103.5°	61	12	19	22	23
104°	64	12	19	23	24
104.5°	67	12	20	23	24
105°	70	13	20	24	25
105.5°	75	13	20	24	25
106°	78	13	21	24	26
106.5°	81	13	21	25	26
107°	84	13	21	25	26
107.5°	89	13	21	26	27
108°	92	13	21	26	27
108.5°	95	14	22	26	27
109°	99	15	22	26	28
109.5°	103	16	22	27	28
110°	106	17	22	27	28
110.5°	110	19	22	27	29
111°	113	21	22	28	29
111.5°	117	23	22	28	29
112°	120	26	21	28	30



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
112.5°	123	28	21	28	30
113°	127	32	21	28	30
113.5°	130	37	21	28	30
114°	133	41	21	28	30
114.5°	137	46	21	28	30
115°	140	51	21	28	30
115.5°	144	56	21	27	30
116°	147	61	21	27	30
116.5°	150	66	21	27	30
117°	154	71	20	27	30
117.5°	157	76	20	27	30
118°	160	80	20	27	29
118.5°	163	85	20	26	29
119°	166	90	20	26	28
119.5°	170	94	20	26	28
120°	173	99	21	26	28
120.5°	176	103	21	26	28
121°	179	107	21	26	28
121.5°	182	110	22	25	27
122°	186	115	23	25	28
122.5°	189	119	24	25	27
123°	193	123	25	25	27
123.5°	196	127	26	24	27
124°	199	131	28	24	26
124.5°	202	134	30	24	26
125°	205	138	32	24	25
125.5°	208	142	35	24	25
126°	211	146	38	24	25
126.5°	214	150	42	24	25
127°	218	154	46	25	25
127.5°	221	159	51	25	25
128°	224	163	57	26	25
128.5°	227	167	63	27	25
129°	229	171	69	27	25
129.5°	233	175	75	29	26
130°	235	179	80	30	26
130.5°	238	183	86	31	27
131°	241	187	93	33	28
131.5°	244	191	98	34	29
132°	247	195	104	37	30
132.5°	250	199	111	39	32
133°	253	203	117	43	33
133.5°	256	207	122	47	35
134°	259	212	128	52	38
134.5°	261	216	134	57	40



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CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
135°	264	220	140	63	43
135.5°	267	223	145	70	47
136°	269	227	151	77	52
136.5°	272	232	156	83	57
137°	275	236	161	90	64
137.5°	277	239	166	97	70
138°	280	244	171	104	78
138.5°	283	248	175	111	86
139°	285	251	179	118	93
139.5°	287	255	183	124	99
140°	290	258	187	131	105
140.5°	292	262	192	137	113
141°	294	266	196	144	119
141.5°	297	270	200	151	126
142°	300	273	205	158	134
142.5°	302	277	209	164	142
143°	304	280	213	170	149
143.5°	307	284	218	176	155
144°	309	288	222	182	161
144.5°	311	291	227	187	168
145°	313	295	231	192	175
145.5°	316	298	236	197	181
146°	318	302	240	202	186
146.5°	320	305	244	206	193
147°	323	309	249	211	198
147.5°	325	312	253	216	202
148°	327	315	258	220	207
148.5°	329	318	262	225	212
149°	332	322	267	230	217
149.5°	334	324	271	235	221
150°	336	328	275	239	226
150.5°	338	330	280	244	231
151°	340	333	284	249	236
151.5°	342	335	288	254	241
152°	344	338	293	258	246
152.5°	346	341	297	263	251
153°	348	344	302	268	256
153.5°	350	346	306	273	261
154°	352	348	310	277	266
154.5°	354	351	314	283	270
155°	355	353	318	287	274
155.5°	357	356	321	292	280
156°	359	358	325	296	285
156.5°	361	360	330	301	290
157°	362	362	333	305	295



TEST NUMBER: 17278

CATALOG NUMBER: HBE-432-W-UNV-EB81/PLUS-UPL-U

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
157.5°	364	364	337	310	300
158°	366	367	342	316	305
158.5°	367	369	344	320	309
159°	369	371	348	324	313
159.5°	370	372	352	329	318
160°	372	374	355	334	325
160.5°	373	376	358	338	329
161°	375	377	361	342	332
161.5°	376	379	365	346	337
162°	378	381	367	350	342
162.5°	379	382	370	354	346
163°	381	384	372	358	351
163.5°	382	386	375	362	354
164°	383	387	377	366	359
164.5°	384	388	379	369	363
165°	386	390	382	372	366
165.5°	387	391	384	376	370
166°	388	392	386	378	374
166.5°	389	394	388	381	377
167°	390	395	389	383	380
167.5°	391	396	391	385	382
168°	393	397	393	388	384
168.5°	393	398	394	390	387
169°	394	399	395	392	389
169.5°	395	400	396	394	392
170°	396	401	397	396	394
170.5°	397	402	398	397	395
171°	398	403	399	398	397
171.5°	398	403	400	399	398
172°	399	404	401	400	399
172.5°	400	405	402	401	401
173°	400	405	402	402	402
173.5°	401	406	403	403	402
174°	401	406	404	403	403
174.5°	402	407	404	404	404
175°	403	408	405	405	404
175.5°	403	408	405	405	405
176°	403	408	406	406	405
176.5°	403	408	406	406	406
177°	403	409	406	407	406
177.5°	404	409	406	407	406
178°	404	409	407	407	407
178.5°	404	409	407	407	406
179°	404	409	407	408	407
179.5°	404	409	407	408	407



TEST NUMBER: 17278

CATALOG NUMBER: HBE-432-W-UNV-EB81/PLUS-UPL-U

CANDELA DISTRIBUTION (continued):

	0°	22.5°	45°	67.5°	90°
180°	407	407	407	407	407

(END OF REPORT)